

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An adapter for a surface mount device, the adapter comprising:

an insulating body having offset first and second surfaces;

a plurality of surface mount solder pads formed on the first surface in a pattern structured for connection thereto of a replacement surface mount device;

a pattern of signal carriers communicating between the first and second surfaces, each of the signal carriers being at least partially exposed in a peripheral area extending between the first and second surfaces and in an area adjacent to the second surface;

a plurality of electrical contacts formed on the second surface and being electrically coupled to different ones of the signal carriers, the plurality of ~~surface mount solder pads~~ electrical contacts formed on the ~~first~~ second surface being structured for connection to a corresponding contact area of a parent printed circuit board; and

a plurality of signal lines electrically coupling one or more of the surface mount solder pads on the first surface with predetermined ones of the signal carriers, fewer of the surface mount solder pads on the first surface of the insulating body being provided for connection thereto of a replacement surface mount device than the plurality of electrical contacts formed on the second surface of the insulating body for connection to a corresponding contact area of a parent printed circuit board for a replaced device.

Claim 2 (cancelled)

Claim 3 (original): The adapter of claim 1 wherein the insulated body further comprises a signal layer laminated between the first and second surfaces with one or more of the plurality of signal lines being formed on the signal layer.

Claim 4 (original): The adapter of claim 1 wherein each of the signal carriers further comprises an electrically conductive material formed on an interior surface of a passage that communicates between the first and second surfaces.

Claim 5 (original): The adapter of claim 1 wherein the signal lines couple a function of a replacement surface mount device to a signal carrier that corresponds to a position in the pattern of signal carriers that is associated with a similar function provided by a replaced surface mount device.

Claim 6 (currently amended): A surface mount adapter for a surface mount device, the adapter comprising:

- a printed circuit board having a top layer and bottom layer;

- a first footprint comprising a first quantity of input/output leads formed on the top layer of the printed circuit board for receiving a replacement surface mount device;

- a second footprint comprising a second quantity of input/output leads formed on the bottom layer of the printed circuit board and arranged for simulating a surface mount device replaced by the first replacement surface mount device, the second quantity of input/output leads being greater than the first quantity and being arranged for electrical connection to a parent printed circuit board in a position corresponding to the replaced surface mount device; and

- a plurality of input/output lines connected between the first foot print and one or more of a plurality of electrical contacts corresponding to the second foot print, at least a portion of each of the input/output lines adjacent to the bottom layer being exposed between the top and bottom layers.

Claim 7 (original): The adapter of claim 6, further comprising a plurality of solder pads formed on the top layer and corresponding to the first foot print.

Claim 8 (original): The adapter of claim 7 wherein the input/output lines couple one or more of the solder pads on the top layer to one or more of the plurality of electrical contacts on the bottom layer.

Claim 9 (original): The adapter of claim 7 wherein the electrical contacts further comprise a plurality of solder pads formed on the bottom layer and corresponding to the second foot print.

Claim 10 (original): The adapter of claim 6 wherein each of the plurality of input/output lines further comprises a quantity of electrically conductive metal deposited in a groove that communicates between the top and bottom layers.

Claim 11 (original): The adapter of claim 6 wherein the second foot print is different from the first foot print.

Claim 12 (currently amended): An adapter for a surface mounted device, the adapter comprising:

a printed circuit board having a top layer and a bottom layer;

a first pattern of solder pads formed on the top layer of the printed circuit board, the first pattern being structured with a first quantity of solder pads for receiving a first replacement surface mount device, the first replacement surface mount device having both an input and an output connections identical to a second surface mount device to be replaced by the replacement surface mount device with the input and an output connections of the replacement surface mount device being fewer than the input and output connections of the second surface mount device to be replaced, and the first quantity of solder pads being of a number corresponding to the fewer input and output connections of the first replacement surface mount device;

a plurality of vias formed along a periphery of the printed circuit board and communicating between the top layer and the bottom layer, each of the vias having a quantity of electrically conductive material deposited therein;

an electrical signal line coupled between one of the solder pads and one of the vias; and

a second pattern of electrical contacts formed on the bottom layer of the printed circuit board, the second pattern being structured with a second quantity of solder pads being of a number corresponding to the number of input and output connections of the second surface mount device to be replaced by the replacement surface mount device and further being arranged to simulate the input and output connections of the second surface mount device.

Claim 13 (original): The adapter of claim 12 wherein at least a portion of the electrically conductive material in each of the plurality of vias adjacent to the corresponding electrical contacts formed on the bottom layer is exposed between the top and bottom layers.

Claim 14 (original): The adapter of claim 12 wherein each of the plurality of vias further comprises an electrically conductive material plated on an interior surface of a partial cylindrical passage.

Claim 15 (previously presented): The adapter of claim 12 wherein the printed circuit board further comprises a plurality of interconnected layers including a signal layer and a ground layer.

Claim 16 (currently amended): An adapter for a surface mounted device, the adapter comprising:
a body means for supporting a first surface mounted device relative to a printed circuit board;

a first quantity of interconnecting means corresponding to input and output connections of a first surface mounted device that is structured to replace a second surface mounted device, the first quantity of interconnecting means being positioned on a first surface of the body means for electrically interconnecting to the input and output connections of the first surface mounted device;

a second quantity of interconnecting means corresponding to input and output connections of a second surface mounted device to be replaced by the first surface mounted device, the second quantity of interconnecting means being positioned on a second surface of the body means for electrically interconnecting to a printed circuit board structured to receive the second surface mounted device, the second quantity of interconnecting means being greater than the first quantity of interconnecting means; and

means for electrically coupling the first and second electrically interconnecting means, at least a portion of the electrically coupling means being exposed between the first and second surfaces of the body means.

Claim 17 (previously presented): The adapter of claim 16 wherein the electrically coupling means further comprises signal communication means spanning between the first and second surfaces along a peripheral surface of the body means.

Claim 18 (previously presented): The adapter of claim 16 wherein the exposed portion of the electrically coupling means is positioned adjacent to the second surface of the body means.

Claim 19 (original): The adapter of claim 16 wherein the first interconnecting means further comprises means for forming an electrically conductive solder joint.

Claim 20 (previously presented): A method for adapting a first surface mounted device having a first quantity of input/output leads to replace a second surface mounted device having a second quantity of input/output leads that is different from the first quantity of input/output leads, the method comprising:

- providing first electrical interconnecting means structured for coupling to a first quantity of input/output leads of a first surface mounted device;

- providing second electrical interconnecting means structured for coupling to a printed circuit board structured to receive a second surface mounted device having a second quantity of input/output leads that is different from the first quantity of input/output leads, including providing the second electrical interconnecting means at a portion of an adapter body that remains available for visual inspection after assembly to a parent printed circuit board; and

- providing signal conduction means for carrying input/output signals between the first and second electrical interconnecting means.

Claim 21 (previously presented): The method of claim 20 wherein providing the second electrical interconnecting means at a portion of an adapter body that remains available for visual inspection after assembly to the parent printed circuit board further comprises providing at least a portion of the second electrical interconnecting means along an exterior surface of the adapter body.

Claim 22 (original): The method of claim 20 wherein providing first electrical interconnecting means structured for coupling to input/output leads of a first surface mounted device further comprises forming a first quantity of solder pads on a top layer of the adapter body in a pattern structured to receive the input/output leads of the first surface mounted device.

Claim 23 (original): The method of claim 22, further comprising soldering the input/output leads of the first surface mounted device to corresponding ones of the solder pads.

Claim 24 (original): The method of claim 20 wherein providing second electrical interconnecting means structured for coupling to a printed circuit board structured to receive a second surface mounted device further comprises forming a quantity of contacts on a bottom layer of the adapter body in a pattern structured in a pattern simulating input/output leads of the second surface mounted device.

Claim 25 (previously presented): The method of claim 24, further comprising soldering the contacts on the bottom layer of the adapter body to solder pads on the parent printed circuit board corresponding to input/output leads of the second surface mounted device.

Claim 26 (previously presented): The method of claim 20 wherein providing signal conduction means for carrying input/output signals between the first and second electrical interconnecting means further comprises providing signal conduction means between one of the first electrical interconnecting means structured to couple to one input/output lead of the first surface mount device for providing a first input/output signal and one of the second electrical interconnecting means structured to couple to a contact on the parent printed circuit board that is structured to communicate with an input/output signal of the second surface mounted device similar to the first input/output signal of the first surface mount device.

Claim 27 (previously presented): A parent printed circuit board assembly having a replacement surface mount device substituted for an original surface mounted device, the assembly comprising:

- an adapter printed circuit board having a top layer and a bottom layer;

- a footprint formed on the top layer of the adapter printed circuit board;

- a replacement surface mount device being mounted to the footprint on the top layer of the adapter printed circuit board;

- a plurality of signal carriers positioned along different peripheral edges of the adapter printed circuit board and extended between the top and bottom layers of the adapter printed circuit board and being at least partially exposed in an area adjacent to the bottom layer, each of the signal carriers being electrically and mechanically joined to a corresponding contact area of a parent printed circuit board; and

a plurality of signal lines communicating between corresponding contact areas of the foot print and at least a portion of the signal carriers, fewer of the corresponding contact areas of the foot print on the top layer of the adapter printed circuit board being provided for the replacement surface mount device than the contact areas provided on the parent printed circuit board for a replaced device.

Claim 28 (original): The adapter of claim 27, further comprising an electrical contact pad formed on the bottom layers of the printed circuit board at each of the signal carriers.

Claim 29 (previously presented): The adapter of claim 27, further comprising a solder joint whereby the signal carriers are electrically and mechanically joined to corresponding contact areas of the parent printed circuit board, each of the solder joint being at least partially formed on the partially exposed portion of each of the signal carriers.

Claim 30 (previously presented): The adapter of claim 27 wherein the replacement surface mount device is a replacement device structured to provide input/output signals substantially identical to input/output signals provided by the replaced device.

Claim 31 (previously presented): The adapter of claim 30 wherein input/output signals of the replacement device are coupled to contact areas of the parent printed circuit board structured to interface with corresponding input/output signals of the replaced device.

Claim 32 (previously presented): A parent printed circuit board assembly having a replacement surface mount device substituted for an original surface mounted device, the assembly comprising:

- an adapter printed circuit board having a top layer and a bottom layer;

- a footprint formed on the top layer of the adapter printed circuit board;

- a first surface mount device being mounted to the footprint on the top layer of the adapter printed circuit board, the first surface mount device being a replacement device structured to provide input/output signals substantially identical to input/output signals provided by a replaced device;

- a plurality of signal carriers positioned along different peripheral edges of the adapter printed circuit board and extended between the top and bottom layers of the adapter printed

circuit board and being at least partially exposed in an area adjacent to the bottom layer, each of the signal carriers being electrically and mechanically joined to a corresponding contact area of a parent printed circuit board; and

a plurality of signal lines communicating between corresponding contact areas of the foot print and at least a portion of the signal carriers, the signal lines being arranged such that input/output signals of the replacement device are coupled to contact areas of the parent printed circuit board structured to interface with corresponding input/output signals of the replaced device; and

wherein fewer of the corresponding contact areas of the foot print are provided for the replacement device than the contact areas provided on the parent printed circuit board for the replaced device.

Claim 33 (cancelled)

Claim 34 (previously presented): The method of claim 20 wherein providing first electrical interconnecting means structured for coupling to a first quantity of input/output leads of a first surface mounted device further comprises providing a first quantity of contact areas for the first quantity of input/output leads of the first surface mounted device; and

wherein providing second electrical interconnecting means structured for coupling to a printed circuit board structured to receive a second surface mounted device having a second quantity of input/output leads that is different from the first quantity of input/output leads further comprises providing a second quantity of contact areas for the second quantity of input/output leads that is greater than the first quantity of contact areas.